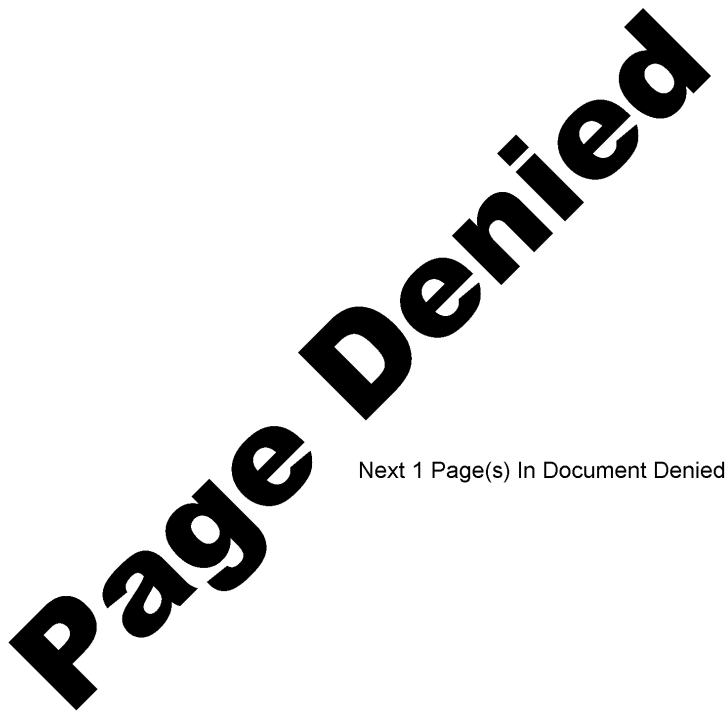

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USSR Leningrad

A Scientific Research Inst No. N11-380 - Magnetron Testing Instr. -

B Inst. has 2 Universal Milling Machines (Till Co. Suhl), 4 mechanics lathes in good condition used mainly for magnetron anodes. Machines accurate to 1/200 mm, controlled by measuring microscope. Tests made to polish slots electrolytically, but Russian engineers not interested. Vacuum measurements are done electrically with Russian instrument which can be controlled by a "Mac Lot" (MacLeod ?) instrument to 10^{-6} mm.

C 1950 development improved over 1948 (Arnstadt). Their Millimeter technique of advantage but Russian advantage is in numbers of young people given a chance to work with magnetron. Students, before final exams, are sent to Institute for a few months of practical work. Their theoretical education is good: but no practical experience. This they have, to a certain extent, when leaving the Institute. This plan, as carried out, forces Lab. into role of teacher and not that of Researcher.

D 1) Impulsegenerator - up to 20,000 v, 30 amp, impulse:1 microsec. Frequ. up to 1000 cycl
a)- Impulse generator of German make, known during war as "Schnecke."
b)- Impulse amplifier amplifies impulses to above named values

2) Electromagnetic Rack - fitted with filament transformer and electromagnet; max. field strength betwe. poles (15 mm) approx. 9600 gauss.

3) Equipmt. for making impulse visible, measures the impulse current and the impulse voltage, controls shape of impulse.

4) Wave Meter. - Measurings originally done with thermocouple, replaced by detector which is more efficient. Distance from magnetron had to be increased and vibrations at magnetr. were discovered which had not been known to exist especially for the 4 mm magnetron. Wavelength could be determined for a good 8 mm magnetron wth accuracy of 0.01 mm. At the same time this method of measuring waves was used to prove existence of multiwave properties in magnetrons, since during wave measurements different results were obtained at beginning and end of a rotation of the wavemeter. It was not possible to determine frequency spectrum since no spectrum analyser was on hand. Some thought was given to constructing a heterodyne frequency meter.

5) Broadband amplifier - Amplific. approx. 130 x, bandwidth approx 3 mc/mm .

6) Power Measuring Instrument - Differences are measured of temperatures of water flowing at uniform velocity into and out of container which is heated by HF energy.

7) Galvanometer - (made by Dr. Lange Plant). Sensitivity approx. 2.10 - 8 amp each. Three of these are in use at the Institute.

8) Field Strength Meter (AEG)

Only one small series of 4 each 4 mm magnetrons was built. The total of 3 series of the 8 mm series had 8 - 10 magnetrons each. The cathode diameter of the nickel tube was 4.8 mm for the 4 mm, and 1.8 - 1.9 mm for the 8 mm magnetron. The length of both cathodes was 10 mm. In the early 1950 an output of 4% was obtained from the 8 mm magnetron with a magnetic field of 6000 gauss. In July 1950 a field of 11000 to 12000 gauss gave 12%. Of the 8 mm magnetrons only about 2 of ea. series were successful, i.e. 6 units. Only 1 sample of the 4 mm magnetrons could be used. The 8 mm sample was built into the test transmitter; these were apparently radar instruments since the radar lab. showed great interest in the development of the 8 mm magnetron. Special emphasis was laid by them on the accuracy of the 8 mm wavelength. The 4 mm magnetron was accidentally destroyed.

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